Space Weather Forecast

Issued on Friday, 15 July 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: R1-R2 blackouts likely, with a slight chance of R3 blackouts and S1 proton storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with two Moderate class flare and numerous Common class flares observed over the past 24 hours. There are currently five sunspot regions on the visible disc, four numbered, and all large groups in size, and some moderately magnetically complex. The new, yet to be numbered, region in the northeast is currently hard to asses as it is still close to the eastern limb, but it's classification is likely to be upgraded as it rotates onto the visible disc, as this region produced the two Moderate class flares. A CME was associated with the first flare, but this is unlikely to be Earth directed. A second CME was emitted from the Sun later in the day, most likely from a filament on or close to the southeast limb, and this CME is also not expected to be Earth directed. Numerous large filaments remain on the visible disc, with currently some movement from a filament in the southern hemisphere, which will be monitored

Solar Wind / Geomagnetic Activity: The solar wind has been elevated, predominantly between 520-570 km/s, peaking at 586 km/s at 14/0610 UTC. The solar wind's magnetic field was initially weak but rose to moderate after 14/1035UTC, with the important north-south component also weak, and southward from 14/1436 UTC. These parameters would suggest that Earth is under the influence of an enhanced solar wind environment. The corresponding geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Moderate, with a slight chance of strong (X-class) flares.

Solar Wind / Geomagnetic Activity: Solar winds are expected to remain elevated on day 1 (15th) due to the on-going solar wind enhancement. Through day 3 (17th) solar winds are forecast to decrease to slightly elevated levels, then possibly down to background levels by the end of the period. No Earth directed Coronal Mass Ejections are currently expected during the period. Predominantly Quiet geomagnetic activity is expected, with isolated Unsettled intervals possible.

Energetic Particles / Solar Radiation: The high energy proton flux (greater than 10 MeV) is likely to remain at background levels. There is however a daily Slight Chance of S1 or greater event, due to the presence of two relatively large sunspot regions transiting across the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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